[COMMITTEE PRINT]

LETTERS AND COMMENTS ON THE COLLBRAN PROJECT, COLORADO

FOR USE IN HEARINGS ON

H. R. 2813

A BILL TO AUTHORIZE THE SECRETARY OF THE INTERIOR TO CONSTRUCT, OPERATE, AND MAINTAIN THE COLLBRAN RECLAMATION PROJECT, COLORADO

(Introduced by Hon. Wayne N. Aspinall, M. C.)

UNITED STATES
GOVERNMENT PRINTING OFFICE
86332 WASHINGTON : 1951

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LETTERS AND COMMENTS ON THE COLLBRAN PROJECT, COLORADO

DEPARTMENT OF THE INTERIOR,
OFFICE OF THE SECRETARY,
Washington, D. C., July 3, 1951.

Hon. SAM RAYBURN,
Speaker of the House of Representatives,
Washington 25, D. C.

MY DEAR MR. SPEAKER: My report on the Collbran project, Colorado, is transmitted herewith pursuant to the provisions of section 9 (a) of the Reclamation Project Act of 1939 (53 Stat. 1187).

The Collbran project is a multiple-purpose project designed to utilize waters of Plateau Creek, a tributary of the upper Colorado River in western Colorado, for irrigation, municipal water supply, and hydroelectric power production. The area to be served by the municipal water supply features of the project includes the city of Grand Junction, Colo., now experiencing industrial expansion as a result of the nearby deposits of oil-bearing shales, uranium ores, and other minerals. Irrigation supplies would be provided for about 20,000 acres of land in Plateau Valley east of Grand Junction, and hydroelectric power plants having an installed capacity of 7,400 kilowatts capacity would be installed along the pipeline required to serve the municipal water users.

The report has been transmitted to the States of the Colorado River Basin and to the Secretary of the Army for their views and recommendations as required by the provisions of the Flood Control Act of 1944 (58 Stat. 887); to the State of Colorado for the comments of the head of the agency exercising administration over the wildlife resources of that State, as required by the provisions of the act of August 14, 1946 (60 Stat. 1080); and to the Federal agencies which might have an interest in the proposed project, in accordance with interagency agreements. Copies of all the comments received in response to these transmittals are enclosed with the report.

The report and the comments received were submitted to the President with a request for advice concerning the relationship of the proposed project to his program. A copy of the comments of the Director of the Bureau of the Budget is enclosed with the report.

Sincerely yours,

WM. E. WARNE,
Assistant Secretary of the Interior.

Summary—Collbran project

		Average annual quantities
Water supply:		
New irrigation water	acre-feet	15, 900
New municipal water (ultimate)	do	10, 300
Stream depletion:		
Plateau Creek	do	21, 000
Colorado River	do	10, 700
Irrigated area:		
Lands receiving supplemental water	acres	18, 340
Lands receiving full water supply	do	2, 310
Total	do	20, 650
Power:		
Installed capacity	kilowatts	7, 400
Annual generation:		
Firm power	kilowatt-hours	51, 600, 000
Nonfirm power	do	6, 670, 000
Total	do	58, 270, 000

COSTS AND PAYMENT

Purpose served	Cost allocation	Payment period (years)	Net revenues available in payment period
Irrigation	$3, 987, 000	50	$1, 000, 000
Municipal use	2, 742, 000	60	[1] 4, 733, 000
Power	6, 313, 000	60	[2] 13, 737, 600
Fish and wildlife	257, 000	[3]	
Total	13, 299, 000		[4] 19, 470, 600

[1] Based on annual payment of $78,880, required to retire municipal allocation in 60 years at 2 percent interest.
[2] Based on firm power rate of 5.6 mills a kilowatt-hour and nonfirm rate of 3 mills, required to retire power allocation in 60 years at 3 percent interest.
[3] Fish and wildlife allocation considered nonreimbursable.
[4] Returns to Federal Treasury during payment period would exceed project costs, except nonreimbursable costs allocated to fish and wildlife, by $6,428,600.

Benefit-cost ratio ..... 2.34 to 1

EXECUTIVE OFFICE OF THE PRESIDENT,
BUREAU OF THE BUDGET,
Washington 25, D. C., June 19, 1951.

The honorable the SECRETARY OF THE INTERIOR.

MY DEAR MR. SECRETARY: This acknowledges your letter dated May 9, 1950, submitting your Department's report on the Collbran project, Colorado, prepared by the regional director, region 4, Bureau of Reclamation, and requesting advice as to the relationship of the proposals in that report to the President's program.

The proposed Collbran project, in west central Colorado on the west slope of the Continental Divide, would supply additional water for irrigation purposes to lands in the Plateau Valley; supplemental water to Grand Valley and vicinity for industrial, municipal, and and domestic purposes; and hydroelectric power for use in central Colorado. The irrigation features of the project would consist of Vega Dam and Reservoir on Plateau Creek with a storage capacity of 30,000 acre-feet, the Leon Creek-Park Creek feeder canal to divert flows of these two creeks into the reservoir, and the southside canal extending 30 miles from the reservoir to project lands to furnish a

supplemental water supply for 18,340 acres now inadequately irrigated and a full irrigation supply for 2,310 acres of new irrigated land. The industrial, municipal, and domestic water supply features include include Bonham Reservoir on Big Creek enlarged to a storage capacity of 6,300 acre-feet together with eight natural lakes in the headwaters of Big and Cottonwood Creeks with an aggregate storage capacity of 3,830 acre-feet, two feeder canals to divert flows into the reservoirs, a pipeline approximately 44 miles long with a minimum capacity of 20 second-feet to convey water from the reservoirs to an equalizing reservoir near Grand Junction to be built by potential water users. Hydroelectric power would be generated by the 20-second-foot pipeline flow at two power plants, one located about 3½ miles from Molina, Colo., with an installed generating capacity of 5,000 kilowatts and one near Cameo of 2,400-kilowatt capacity. These two power plants would produce approximately 51,600,000 kilowatt-hours of firm power and 6,670,000 kilowatt-hours of nonfirm power annually.

The estimated construction cost of the project is $13,299,000 and the estimated annual operation, maintenance, and replacement costs total $108,800. An amount of $257,000 of the total construction cost is allocated to nonreimbursable fish and wildlife. The remaining $13,042,000 is considered reimbursable, of which $3,987,000 is allocated to irrigation, $2,742,000 to municipal water and $6,313,000 to power production. A payment period of 50 years is assumed for irrigation water users and it is estimated the net revenue will total $1,000,000, or $2,987,000 less than the cost allocated to irrigation. It is proposed to make up this deficiency by diverting the necessary amount from the interest payments on power. The total annual cost to project farmers is estimated to be $41,000, or about $1.98 per acre on the basis of 20,650 acres of irrigated land. The annual amount to be applied to maintenance and operation of irrigation works is estimated to be $21,000, leaving $20,000 available for repayment of capital costs.

The amount of $6,313,000 allocated to power production cost represents nearly $850 per installed kilowatt capacity. The repayment period for power is assumed as 60 years with interest at 3 percent. The average annual operation, maintenance, and replacement costs for power production are estimated at $80,000 annually. On the basis of disposing of the output of both plants at the rate of 5.6 mills for firm power and 3 mills for nonfirm power, it is estimated that the annual revenue would be $308,960. The interest component would amount to $7,285,584 in 60 years, and it is proposed to divert $2,987,000 of this to the repayment of the cost allocated to irrigation. The report submits a study indicating that electric-energy requirements in the project area would increase from 59,450,000 kilowatt-hours in 1946 to 144,000,000 kilowatt-hours in 1960, but indicates that existing facilities generated 156,814,000 kilowatt-hours in 1946, most of which was sold outside the project area. It also states that all of the market area is not immediately available to project power, and construction of the necessary transmission system would prove too costly.

It is proposed to repay the allocation to industrial, municipal, and domestic water supply over a 60-year period with interest at 2 percent. Users would be charged at rates sufficient to provide an annual revenue

of $78,800 in addition to operation and maintenance costs. The report does not develop these rates nor the anticipated number of customers to be attached. It does state that the present system at Grand Junction can supply 430 gallons per capita daily and is considered adequate to meet present peak demands for the 18,500 people served. Based on the assumption of steady population increases it is estimated that the project system could serve 31,000 customers at the end of 50 years.

In its letter dated March 28, 1950, the Colorado River Board of California questions the ability of the project to develop sufficient quantities of firm commercial power to produce the assumed annual power revenues throughout the repayment period. It also comments on the proposal to extend pay-out periods permissible under existing law and the diversion of the interest component of power revenues and expresses the opinion that this would not comply with existing reclamation law.

The Department of Agriculture, in its letter dated April 26, 1950, states that the proposal to furnish supplemental irrigation water to Plateau Valley seems to be economically sound but suggests that a separate evaluation be set out in the report to substantiate such conclusion. The Department also questions the validity of certain assumptions made in the report in estimating benefits resulting from irrigation, particularly those credited as indirect benefits. It is noted, however, that aside from the strictly favorable benefit-cost comparison used in the report to justify the project, the irrigation features which primarily are for supplemental water, approach an average cost of approximately $200 per acre, three-fourths of which is proposed as a Federal subsidy in addition to the interest-free money on the one-fourth that is reimbursable.

Included in the comments submitted by the Federal Power Commission in its letter of April 14, 1950, is a reference to the contrast between the 50- and 60-year repayment periods assumed and the 100-year period used for purposes of benefit-cost analysis. The Commission states that experience has demonstrated that no period longer than 50 years is justified for economic analyses, at least with respect to power projects.

It is also noted that combinations of various methods have been applied in estimating benefits and cost allocations. Based on the information made available, it is impossible to determine the effects of other methods of computation on the feasibility of the project. The Federal Inter-Agency River Basin Subcommittee on Benefits and Costs has recently developed a proposed manual for the use of all agencies in the economic analyses of river-basin projects. With regard to the evaluation procedure adopted for the Collbran project, we can only question its justification in the absence of accepted methods. It would seem important that an agreement be reached at an early date on mutually acceptable methods for determining benefits and cost allocations. It would be perfectly clear then that evaluation methods employed were not adopted for the purpose of placing the economics of the project in the most favorable light.

The proposed repayment plan contemplates the use of a portion of the interest component of the power revenues as an irrigation subsidy. The President's position, with regard to this proposal, was

discussed in the Director's letter of July 17, 1950, on the Palisades project. With respect to the use of the interest component, the Director's letter on the Palisades project stated:

> The President has neither approved nor disapproved such action from the standpoint of national policy. Furthermore, while it is recognized that the Solicitor of the Department of the Interior had issued an opinion that the interest component on the power investment could be so applied, the President has not indicated agreement that the present law should be so interpreted. He is reserving judgment on the issue pending the report of the Water Resources Policy Commission.

The Water Resources Policy Commission has submitted its report to the President and its recommendations are now under review and analysis within the executive branch. Until the President has had an opportunity to appraise the findings of his Water Resources Policy Commission in the light of all available data, his position remains as stated above.

The President's position regarding Federal water-supply projects for industrial, municipal, and domestic purposes is stated in the Director's letter of June 19, 1950, on the Canadian River project, as follows:

> It should be recognized that the Canadian River development would be the first improvement of an essentially municipal and industrial water supply character authorized under reclamation law. While I would not in this case question the authority for considering the proposed project under reclamation law, it would, if approved, place the United States in the position of assuming a new type of primary responsibility in the water-resources field. Up to this time, the provision of municipal water supplies has been only an incidental feature of multiple-purpose water developments, to such primary purposes as flood control, navigation, or irrigation. * * * The project raises, therefore, the important question of national policy relative to the possible future scope of the responsibility of the Federal Government for providing adequate municipal and industrial water supplies on a Nation-wide basis. * * * There should also be a clear understanding that the total cost of furnishing water supplies would be returned to the Federal Government with interest, in a stated period of years, regardless of whether the cities' population and load growth develop as estimated in the report.

While it is recognized that the Director's letter of June 19, 1950, deals with a project designed primarily for municipal water supply, the principle of repayment should apply regardless of whether the municipal water-supply feature of a project is incidental or of major importance. In connection with the Canadian River reclamation project, Texas, Public Law 898, Eighty-first Congress, second session, authorizing the project on December 29, 1950, provides under section 2 (b) that—

> Actual construction of the project herein authorized shall not be commenced, and no construction contract awarded therefor, until * * * repayment of that portion of the actual cost of constructing the project which is allocated to municipal and industrial water supply and of interest on the unamortized balance thereof at a rate (which rate shall be certified by the Secretary of the Treasury) equal to the average rate paid by the United States on its long-term loans outstanding at the time the repayment contract is negotiated minus the amount of such net revenues as may be derived from temporary water supply contracts or from other sources prior to the close of the repayment period, shall have been assured by a contract satisfactory to the Secretary, with one central repayment contract organization, the term of which shall not exceed 50 years from the date of completion of the municipal and industrial water supply features of the project as determined by the Secretary.

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With further reference to repayment periods for reclamation projects, the President stated in his letter of March 29, 1948, on the Provo River project, Utah:

> It has been my understanding that reclamation projects, historically, have been based on the principle that the construction costs to the Federal Government would be repaid, without interest, in 40 years, plus, in some cases, a 10-year development period. My attention has been directed to the increasing number of legislative proposals in the last several sessions of Congress which would serve to extend the periods of repayment for certain reclamation projects. While I can understand that instances may occasionally occur which might justify the Federal Government providing for additional subsidies on reclamation projects either through waiver of interest charges over longer periods of time or possibly, in some cases, through extensions of repayment periods beyond what might eventually turn out to be the useful life of a project. I do not wish my action in approving S. 1990 to be construed as endorsing the principle of extending generally the basic 40-year repayment period for reclamation projects.

The data contained in your proposed report and the comments of the Department of Agriculture indicate the irrigation features of the project to be desirable even though the farmers may be able to repay only a part of the irrigation development costs. The indirect local benefits would appear to be of such nature and magnitude as to warrant the United States subsidizing the irrigation improvement costs above and beyond the amounts which the irrigators can repay. A separate evaluation of total benefits and costs for the irrigation features would, however, be required to substantiate such a conclusion. It would also seem proper then to consider adding the water supply and power features as they may be separately justified on the basis of incremental benefits and costs. Such an analysis would also undoubtedly result in some changes in cost allocations from those shown in the report, although, of course, it would be proper for all purposes to share in the savings resulting from a multiple-purpose improvement.

Accordingly, you are advised that, while there would be no objection to the submission of the proposed report to the Congress, authorization of the project would be without objection only if, in accordance with above comments:

(1) A separate evaluation of the irrigation benefits and costs as outlined above shows the work to be economically justified;

(2) It is understood that the use of the interest component for aiding the return of irrigation costs in the eventual repayment plan for the Collbran project will be dependent on the policy established by the President after he appraises the findings of his Water Resources Policy Commission; and

(3) The costs of the industrial, municipal, and domestic water supply and the hydroelectric power features of the project would be repaid with interest by the beneficiaries of each over a period of not to exceed 50 years.

If authorized by the Congress, any estimate of appropriation for initiation of the project must be justified in accordance with the policy set forth in the President's letter dated July 21, 1950, which directed that all civil works be considered with the objective, as far as practicable, of deferring, curtailing, or slowing down those projects which do not directly contribute to national defense or to civilian requirements essential to the changed international situation, or as may later be modified.

In submitting whatever report you deem appropriate to the Congress it will be appreciated if you will include a copy of this letter with your report.

Sincerely yours,

F. J. LAWTON, *Director.*

DEPARTMENT OF THE INTERIOR,
OFFICE OF THE SECRETARY,
Washington, D. C., May 9, 1950.

The PRESIDENT,
The White House.
(Through Bureau of the Budget.)

MY DEAR MR. PRESIDENT: My report on the Collbran project, Colorado, is transmitted herewith pursuant to section 9 (a) of the Reclamation Project Act of 1939 (53 Stat. 1187).

Increased population and industrial development in the vicinity of the Grand and Plateau Valleys of Colorado have resulted in shortages of irrigation, domestic, and industrial water, and electric power. Further industrial expansion expected with the development of nearby mineral deposits, including oil-bearing shales, uranium ores, and coal will further intensify the shortages. My enclosed report recommends authorization of the Collbran project at an estimated cost of $13,299,000 to provide water and electric power to meet the immediate needs in this area.

The report has been transmitted to the States of the Colorado River Basin and to the Secretary of the Army for their views and recommendations as required by the provisions of the Flood Control Act of 1944 (58 Stat. 887); to the State of Colorado for the comments of the head of the agency exercising administration over the wildlife resources of that State, as required by the provision of the act of August 14, 1946 (60 Stat. 1080); and to the Departments of Agriculture and Commerce, and the Federal Power Commission, in accordance with interagency agreements. Copies of all the comments received are enclosed with the report.

I shall appreciate having advice concerning the relationship of this proposed project to your program before I transmit the report to the Congress for its consideration and appropriate action in accordance with the provisions of the Reclamation Project Act of 1939.

Sincerely yours,

WILLIAM E. WARNE,
Acting Secretary of the Interior.

DEPARTMENT OF THE INTERIOR,
BUREAU OF RECLAMATION,
Washington, D. C., May 8, 1950.

The SECRETARY OF THE INTERIOR.

SIR: Transmitted herewith is my report on the Collbran project, in west central Colorado.

In your behalf, copies of the report which you adopted on December 30, 1949, as your proposed report were sent to the Secretary of the Army and to designated officials of the States of Arizona, California,

Colorado, Nevada, New Mexico, Utah, and Wyoming for their views and recommendations in accordance with the provisions of section 1 of the Flood Control Act of 1944 (58 Stat. 887), and to the Governor of Colorado for the report and recommendations of the head of the agency exercising administration over the wildlife resources of the State of Colorado in accordance with the requirements of the act of August 14, 1946 (60 Stat. 1080). Copies of the proposed report were sent also to the Federal Power Commission and the Departments of Agriculture and Commerce for their comments. Copies of the written views of the States, with the exception of the State of Nevada, from which comments have not been received, and of the Federal agencies are attached with a copy of your proposed report.

The views of the reviewing officials of the States of Arizona, New Mexico, Utah, and Wyoming are favorable to the development of the project in accordance with the plan set forth in your proposed report. The State of California had no official comments to offer. Colorado, the State in which the project works are proposed, concurs in the findings of the report and suggests minor refinements in the project plan which can easily be carried out if found to be feasible at the time the project is under construction.

The Chief of Engineers, writing on behalf of the Secretary of the Army, has advised that the recommended project will not conflict with any of the interests of the Department of the Army. Comments of the other Federal agencies are favorable.

Informal comments on the report which have been received from Rural Electrification Administration cooperatives and municipalities in the area make it desirable for me to point out at this time that in order to serve energy to preference customers in west central Colorado in accordance with reclamation law and departmental policy it will be necessary to construct considerable transmission lines in addition to those specifically discussed in the Collbran report. The nature of the power to be produced by the Collbran project does not fit in well with the type of load to be expected from these preference customers, inasmuch as the energy production at the project plants is based upon very high plant factors, while to satisfy the preference load there would be need for peaking power at low-load factors. This type of load can best be met through facilities which will be provided following construction of power plants and transmission lines in connection with the proposed Colorado River storage project. The power market in this area and the facilities to serve that load are considered to be a part of the storage project. It is contemplated also that there will be interconnection between the Collbran project power plants and the plants of the Colorado River storage project This interconnection is expected to take place almost as soon as power can be produced on the Collbran project. Authorization for transmission facilities to serve preferential customers in this area will therefore be requested as a part of the Colorado River storage project. Should there be substantial lag between the time power is produced on the Collbran project and the time Colorado River storage power will be available, efforts will be made to satisfy preferential customers through wheeling arrangements.

After consideration of all comments received, I suggest no change in your proposed report other than your approval of the above

clarification with respect to the serving of preferential power customers.

Accordingly, I recommend that you adopt the report which you approved on December 30, 1949, as clarified by this letter, as your final report on the Collbran project, and that you transmit it, together with copies of the attached comments, to the President and, subsequently, to the Congress in accordance with the provisions of the Reclamation Project Act of 1939.

Respectfully,

WESLEY R. NELSON,
Acting Commissioner.

Approved and adopted, May 9, 1950:

WILLIAM E. WARNE,
Acting Secretary of the Interior.

DEPARTMENT OF AGRICULTURE,
OFFICE OF THE SECRETARY,
Washington, April 26, 1950.

Mr. MICHAEL W. STRAUS,
Commissioner of Reclamation, Department of the Interior,
Washington, D. C.

DEAR MR. STRAUS: With your letter of January 4, 1950, you transmitted for review by the Department of Agriculture, copies of the proposed report of the Department of the Interior on the Collbran project, Colorado.

Your report in reality proposes two projects. One would supply water to Grand Junction and environs for industrial, municipal, and domestic use, with power production as an associated feature. The other would provide a supplemental water supply for irrigation enterprises in Plateau Valley.

We are not prepared to comment on the municipal water supply project. The policy question involved is, we understand, being considered by the President's Water Resources Policy Commission.

The project to increase the supply of irrigation water available to farmers in Plateau Valley is of direct interest to the Department of Agriculture and it has been examined rather carefully. We have previously questioned the validity of certain assumptions upon which the Bureau of Reclamation bases its estimates of benefits resulting from irrigation projects. In particular we have questioned the estimates of indirect benefits. Some of the questionable evaluation procedures have been used in the present report, but we note that the direct benefits appear to be large enough to cover the cost of the project. It seems, therefore, that the proposal to furnish supplemental irrigation water to Plateau Valley is economically sound. We suggest, however, that a separate evaluation of this project be set out in the report.

We have also examined your estimates of the repayment ability of the Plateau Valley farmers. It is our opinion that you are quite safe in assuming that they can repay the amount proposed in your report.

Your report attaches great significance to the fact that the amount of interest on the Federal investment in the power features of the

municipal water supply project will exceed the required Federal contribution toward the cost of the irrigation project. It seems to us that this is both unnecessary and confusing. If an irrigation project produces benefits in excess of its cost the Federal contribution necessary to put it into effect will be a worth-while investment of public funds. It should only be necessary, therefore, to (*a*) demonstrate that the proposed irrigation project is economically sound; (*b*) show how much the water users and other beneficiaries can and should pay; and (*c*) recommend to the Congress that it authorize the appropriation of the difference between the amount to be paid by local beneficiaries and the cost of the project. Whether the interest component on a power investment is greater or less than this difference has no real bearing upon the justification or desirability of the project, nor upon the amount that must be withdrawn from the Treasury to construct it. We believe that it should be possible to proceed with a good irrigation project even though it cannot be combined with a power project.

We note the proposal to raise the Bonham Dam which is located in the Grand Mesa National Forest. If this is done it would seem desirable to provide for a roadway on its crest, and for the installation of facilities necessary to the development of the recreational potentialities of the lands surrounding the enlarged reservoir. We have no specific suggestions to make at this time regarding other works that you propose to construct in the national forest. You may be sure that your regional office will have the full cooperation of the regional office of the Forest Service in solving any problems that may arise as the project goes forward.

We greatly appreciate the opportunity to review your report and we shall be very happy to cooperate in any way that may be found desirable in making a success of the irrigation project proposed therein.

Sincerely,

K. T. HUTCHINSON,
Assistant Secretary.

DEPARTMENT OF THE ARMY,
OFFICE OF THE CHIEF OF ENGINEERS,
Washington, April 12, 1950.

Hon. MICHAEL W. STRAUS,
Commissioner, Bureau of Reclamation,
Department of the Interior, Washington, D. C.

DEAR MR. STRAUS: Reference is made to your letter of recent date to the Secretary of the Army and to the Chief of Engineers inclosing for the information and comment of the Department of the Army, in accordance with section 1 of the Flood Control Act of 1944, copies of your report dated December 9, 1949, on the Collbran project, Colorado. On behalf of the Secretary of the Army, I am transmitting herewith comments on the report.

Your report recommends a project to supply supplemental municipal and domestic water for communities in Grand Valley, Colorado, additional water for irrigation in Plateau Valley, and electric energy for use in west-central Colorado. The water for the Grand Valley communities would be collected by eight small reservoirs emptying

into a proposed enlarged Bonham Reservoir on Big Creek and into Big Meadow Reservoir on Cottonwood Creek. These creeks are tributaries of Plateau Creek which flows into Colorado River about 20 miles upstream from Grand Junction, Colo. Water would be diverted from the afore-mentioned reservoirs into a pipeline about 44 miles long. The reservoirs are located at an elevation of 10,000 feet. A drop of 5,000 feet to the valley floor would produce an estimated 51,600,000 kilowatt-hours of firm and 6,670,000 kilowatt-hours of secondary power annually. The cost of the improvements proposed is estimated at $13,299,000.

Your report demonstrates the need for development of supplementary water and power in this area. It is noted that the improvements proposed do not involve flood control or navigation. Therefore, I am pleased to advise you that the recommended project will not conflict with improvements in the Colorado River Basin in which this Department has interest.

The opportunity to review your report is appreciated.

Sincerely yours,

LEWIS A. PICK,
Major General,
Chief of Engineers.

FEDERAL POWER COMMISSION,
Washington, April 14, 1950.

Subject: Collbran project, Colorado.

Mr. MICHAEL W. STRAUS,
Commissioner, Bureau of Reclamation,
Department of the Interior, Washington, D. C.

DEAR MR. STRAUS: The remarks herein with respect to the Department of the Interior's proposed report on the Collbran project, Colorado, are transmitted in response to your letter dated January 4, 1950, in which the Commission's comments were requested. Transmitted with your letter were your report dated December 9, 1949, approved and adopted by the Secretary of the Interior on December 30, 1949; and Project Planning Report No. 4–8a.5–2, consisting of the regional director's report dated November 18, 1949, and substantiating materials. The transmittal of these comments is in accordance with the established procedures of the Federal Interagency River Basin Committee.

From a review of your report and from the results of studies by its staff the Commission believes that the Collbran project, subject to certain possible modifications, would provide adequately for the economic development of the water-power resources available in connection with the project. The details of the project and the specific comments and suggestions of the Commission staff are discussed in the following.

The Collbran project is located in the Plateau and Grand Valleys at the base of Grand Mesa on the western slope of the Continental Divide in west central Colorado on the Colorado River and in close proximity thereto. The proposed plan would supply water needed in Grand and Plateau Valleys for irrigation and for municipal and domestic use, through water exchanges and through storage regulation of the stream runoff tributary to Plateau Creek, and provide for the

development of hydroelectric power. Under the plan a minimum continuous flow of 20 cubic feet per second would be diverted from the headwaters of Big and Cottonwood Creeks and conveyed by pipeline to an equalizing reservoir near Grand Junction, Colo., for industrial and municipal use. The diverted water would be used en route at two proposed interconnected power plants developing a total fall of about 5,000 feet. The two plants would have an aggregate installed capacity of 7,400 kilowatts capable of producing a total of 58,270,000 kilowatt-hours of electric energy annually of which 51,600,000 kilowatt-hours would be firm. As the water that would be diverted is now used for irrigation in Plateau Valley, such water would be replaced by surplus spring runoff from upper Plateau, Leon, and Park Creeks. This surplus water would be stored in the proposed Vega Reservoir until needed for irrigation. With regulation at Vega Reservoir these streams would provide, in addition to the required replacement, an average of about 15,900 acre-feet of water annually as a supplemental water supply for 18,340 acres of land in Plateau Valley and a supply for 2,310 acres of new land.

It is recommended in the report that the Collbran project be authorized to be constructed, operated, and maintained by the Bureau of Reclamation; and that consideration be given in the future to the inclusion of this project in any basin plan which may be developed in the upper Colorado River Basin.

The proposed Collbran project would consist of Vega Dam and Reservoir on upper Plateau Creek with a total capacity of 30,000 acre-feet, and the Leon Creek-Park Creek feeder canal to divert flows of these two creeks into the reservoir; the southside canal, 30 miles in length, extending from Vega Reservoir to project lands; the enlargement of Bonham Reservoir on Big Creek to a total capacity of 6,300 acre-feet; the use of eight natural lakes in the headwaters of Big and Cottonwood Creeks, with an aggregate usable storage capacity of 3,830 acre-feet; two feeder canals in the headwaters of these two creeks; a pipeline to convey a regulated flow of 20 cubic feet per second from the headwaters of Big and Cottonwood Creeks to an equalizing reservoir to be constructed by local interests for municipal and domestic water supply purposes, at a site near Grand Junction, Colo.; and, en route, the development of hydroelectric power at two power plants to be constructed as a part of the project. It is estimated in the report that the 20 cubic feet per second (13 million gallons daily) would provide the needs for municipal and domestic water supply until about the year 2000.

Power plant No. 1 would be located at Cottonwood Creek about 3.5 miles from Molina, Colo., and would have an installed generating capacity of 5,000 kilowatts. Bonham Reservoir would be utilized as forebay storage in the operation of this plant, and a reinforced concrete afterbay with a capacity of 10 acre-feet would be constructed at the tailrace of the plant, since no natural site is available. The total fall between the Bonham Reservoir and the plant is 2,789 feet. A minimum flow of 20 cubic feet per second in the pipeline and penstock would be maintained throughout the year. Water diverted in excess of 20 cubic feet per second, up to a maximum of 30 cubic feet per second, would be utilized to generate secondary energy at plant No. 1 and this excess flow would then be diverted from the afterbay into the southside canal for irrigation use. The average

annual generation of electric energy would amount to 37,270,000 kilowatt-hours, of which 30,600,000 kilowatt-hours would be firm. The annual load factor operation of the plant would be 85 and 70 percent for average and dry-year conditions, respectively.

Power plant No. 2 would be located on the east bank of the Colorado River near Cameo, Colo. It would have an installed generating capacity of 2,400 kilowatts, and would operate at 100-percent load factor. The plant would utilize a constant flow of 20 cubic feet per second which would be conveyed from the afterbay of plant No. 1 through a 17-mile pipeline and a penstock to plant No. 2. The total fall between the afterbay at plant No. 1 and the nozzle at plant No. 2 is 2,238 feet. No forebay or surge tank would be provided under the project plan. Discharges from the power plant would flow through a 13-mile pipeline to the terminal reservoir near Grand Junction. The annual generation would amount to 21,000,000 kilowatt-hours, all of which would be firm.

The capital cost of the Collbran project, on the basis of July 1948 prices, is estimated in the report as $13,299,000, allocated to the various project purposes as follows:

Municipal and domestic use	$2,742,000
Power production	6,313,000
Irrigation	3,987,000
Fish and wildlife preservation	257,000
Total	13,299,000

The allocation of $257,000 for fish and wildlife is proposed to be nonreimbursable, and the remaining $13,042,000 is to be returned in full to the United States. The cost of the equalizing reservoir near Grand Junction, to be constructed by local interests, is not included in the foregoing amounts. Operation, maintenance, and replacement costs are estimated in the report to average $108,800 annually.

As proposed in the report of your Department, the repayment of reimbursable costs would be made as follows: Municipal and industrial water users would be required to repay their share of the construction cost in 60 years with interest at 2 percent, a total of $78,880 annually, in addition to their share of the annual operation, maintenance, and replacement costs amounting to $7,800. Irrigation water users would be required to repay $20,000 annually over a 50-year period, following a 3-year development period, or a total of $1,000,000, in addition to paying $21,000 annually as their share of the operation, maintenance, and replacement costs. Power rates of 5.6 mills per kilowatt-hour for firm energy and 3.0 mills per kilowatt-hour for nonfirm energy would return $308,960 annually, which would pay the operation, maintenance, and replacement cost of $80,000 per year chargeable to power, return the capital costs allocated to power in 60 years with 3-percent interest, and provide a balance at the end of this period of $139,000. The interest payments on the power investment, totaling $7,285,600, would be used in part to repay that portion of the irrigation allocation, amounting to $2,987,000 or about 40 percent of the total power interest component, which is beyond the ability of the irrigation water users to repay.

The average annual direct benefits are estimated in the report to be $716,160, and the indirect benefits to be $412,340, aggregating $1,128,500.

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In contrast with the 50-year period for irrigation and the 60-year period for municipal and industrial water and power, used in the repayment analysis, a 100-year period has been used for the entire project for purposes of benefit-cost analysis. The staff points out that, at least with respect to power projects, experience has not demonstrated that a period longer than 50 years for economic analyses is justified. However, on the basis used in your report you have estimated annual costs at $482,800, and using your estimated aggregate direct and indirect benefits of $1,128,500 arrive at a benefit-cost ratio of 2.34 to 1. The staff observes that if only the direct benefits are used the ratio becomes 1.48 to 1, with the project still remaining well justified.

The Commission staff's estimate of the value of the project power on the basis of a capacity value of $27.79 per kilowatt for capacity, and 2.37 mills per kilowatt-hour for energy, amounts to $311,000 which is in very close agreement with the expected power revenue of $308,960 per year, as given in your report.

The Commission staff's investigation of the feasibility of developing power at the proposed Vega Reservoir and by utilizing the 800-foot drop along the proposed Southside Canal indicates that neither of these potential power developments is economically feasible at this time. The staff suggests, however, that if it is possible to do so without additional expense the 800-foot drop be concentrated at one or two locations along the canal to facilitate possible future power development.

The staff advises that at power plant No. 1 the proposed installation of 5,000 kilowatts is adequate on the basis of the assumed 30-cubic-feet-per-second maximum discharge and the proposed capacity of the afterbay, and is in substantial agreement with the Bureau's estimate of the amounts of firm and secondary energy available.

The staff is also in substantial agreement with respect to the installed generating capacity of 2,400 kilowatts and the annual output at power plant No. 2, if the plant is to be operated at 100 percent load factor as proposed in the report. The staff believes, however, that it would be desirable, in utilizing the power in the area load, to operate the plant at a substantially lower load factor, say 65 percent, requiring an installation of approximately 3,700 kilowatts. Such enlargement would require a forebay at the end of the 17-mile pipeline and near the head of the penstock, a somewhat larger penstock, and a small afterbay to reregulate the variable discharges. Even if the construction of an afterbay and the enlargement of the installation may be impracticable the staff believes that the forebay would substantially improve the operation of the 17-mile pipeline and power plant and would be desirable and, therefore, merits further investigation.

The staff is of the opinion that it would be desirable to enlarge the 17-mile pipe line between power plant No. 1 and the head of penstock at plant No. 2, in order to assure the assumed capacity flow of 20 cubic feet per second throughout at least the repayment period of 60 years. Estimates by the staff of the friction loss in this pipeline, consisting of 13 miles of 30-inch and 4 miles of 22-inch-diameter welded steel pipe, indicate that after 20 to 30 years of service, the loss due to deterioration and increased friction would exceed the available fall to the top of penstock as shown on drawing No. 482–P–31 in the report. Either an adjustment in the location and profile of the pipeline to

increase its gradient or larger diameters of pipe than those proposed would be required to assure the desired capacity flow.

The opportunity to review and comment on the report of your Department on the Collbran project, Colorado, is appreciated.

Sincerely yours,

NELSON LEE SMITH, *Chairman.*

STATE OF CALIFORNIA,
DEPARTMENT OF PUBLIC WORKS,
Sacramento, April 5, 1950.

Hon. OSCAR L. CHAPMAN,
Secretary of the Interior,
Washington, D. C.

DEAR MR. CHAPMAN: Your proposed report on the Collbran project, Colorado, was received on January 9, 1950. This department has reviewed the report in accordance with the provisions of Public Law 534, Seventy-eighth Congress, second session, and has no comments to offer.

The report was submitted to the Colorado River Board of California for its comments, which have been received and are transmitted herewith for your information.

Yours very truly,

C. H. PURCELL,
Director of Public Works.

INTERDEPARTMENTAL COMMUNICATION

STATE OF CALIFORNIA,
Los Angeles, March 28, 1950.

To: A. D. Edmonston, State Engineer, Division of Water Resources, Sacramento, Calif.
From: Colorado River Board of California.
Subject: Review of Federal reports, Collbran project, Colorado.

Reference is made to letter dated January 4, 1950, from the Commissioner of Reclamation to the Honorable Charles H. Purcell, director of public works, State of California, transmitting, in accordance with the requirements of the Flood Control Act of 1944, copies of the proposed report of the Department of the Interior on the Collbran project, Colorado, Project Planning Report No. 4–82.5–2, dated November 1949, for information and such comments as the State might wish to make. By interdepartmental communication dated January 11, 1950, you transmitted a copy of that report to this office with the request that comments be furnished for incorporation in a report to be submitted by the director of public works. In response thereto the following comments are submitted on behalf of the Colorado River Board of California.

REVIEW OF REPORT

The proposed report of the Secretary was reviewed in considerable detail in this office, particularly with regard to the estimates of water

requirements and stream depletion, and the repayment of reimbursable costs.

The regional director states that, in addition to a supplemental municipal water supply, the project would provide an average of about 15,900 acre-feet of water annually as a new irrigation supply. It is indicated in the substantiating report by the Bureau of Reclamation that the total depletion of Colorado River caused by the increased municipal and irrigation water use and reservoir evaporation would average 10,700 acre-feet a year. There is insufficient detail in the report to substantiate either of these statements. Attempts to check the figures given have been unsuccessful. The report should set forth in terms of diversions less returns to the river the total ultimate annual beneficial consumptive use of water that would result from construction and operation of the project, with ample supporting detail.

There is insufficient evidence in the report to substantiate the estimates of average annual commercial power that would be produced by the two proposed hydroelectric plants. On the basis of the information given it is questionable whether firm commercial power could be developed in quantities sufficient to produce throughout the proposed repayment period the average annual power revenues set up in the report.

The evaluation of anticipated benefits that would accrue from the Collbran project has not been studied in detail in this office since the relation of estimated benefits to costs is not considered a proper criterion upon which authorization of reclamation projects should be predicated under existing law.

The repayment plan set up in the report would not comply with the provisions of existing reclamation law. It is proposed to extend the pay-out periods permissible under present law and to divert a part of the interest component of power revenues to repayment of capital costs. Using the data in the report under review independent financial analyses were made with the repayment periods as established by existing reclamation law and with interest on the municipal and power costs considered as fixed charges to be paid as interest into the Federal Treasury and not to be used a second time to repay capital costs. The results indicate that with proper adjustment of municipal water charges and power rates the reimbursable costs of the Collbran project could be repaid in accordance with the terms of existing reclamation law.

CONCLUDING COMMENTS

On the basis of the data in the report, much of which is not substantiated, the Collbran project appears to be a desirable improvement for the reasons that—

(1) A supplemental municipal and domestic water supply is greatly needed in the project area, particularly in Grand Valley;

(2) There appears to be a potential market for the electric power that would be produced:

(3) A supplementary irrigation water supply would be beneficial in the Plateau Valley;

(4) About 2,300 acres of new land could be brought under irrigation.

Although there is some question regarding the quantities set forth in the proposed report as the new water supply that would be made available by the project and the net additional use of water that would be caused thereby, it appears that the actual quantities resulting from the project construction and operation as proposed would be relatively small, and together with the ultimate requirements of existing and authorized projects in the state of Colorado, would not exceed that State's rightful share under the upper Colorado River Basin compact of the beneficial consumptive use of water apportioned to the upper basin States by the Colorado River compact of 1922.

On the basis of incomplete data in the report it appears that the reimbursable costs as allocated therein could and should be repaid within the periods specified by existing reclamation law, with interest on municipal and power costs paid as such into the Federal Treasury and with annual charges to the water and power users that would be reasonable and within their ability to pay. It is recommended that the repayment plan for the proposed project be revised accordingly. Otherwise, the Colorado River Board of California could not approve the project report, because of the proposed use of the interest on power investment for repayment of capital costs and the unnecessary extension of the repayment period beyond that permitted by existing law.

RAYMOND MATTHEW, *Chief Engineer.*

OFFICIAL COMMENTS OF THE STATE OF COLORADO CONCERNING COLLBRAN PROJECT, COLORADO

(Project Planning Report No. 4–8a.5–2, of Region 4, Bureau of Reclamation, Department of the Interior, dated November 1949)

STATE OF COLORADO,
COLORADO WATER CONSERVATION BOARD,
Denver, Colo., March 27, 1950.

The SECRETARY OF THE INTERIOR.

SIR: On behalf of the State of Colorado, and pursuant to section 1 of the act of December 22, 1944 (58 Stat. 887), there are herewith transmitted the comments, views and recommendations of the State of Colorado concerning Project Planning Report No. 4–8a.5–2 of Region 4, Bureau of Reclamation, Department of the Interior, dated November 1949, and entitled "Collbran Project, Colorado."

These comments, views and recommendations are submitted under the authority of chapter 265, Session Laws of Colorado of 1937, creating the Colorado Water Conservation Board and defining its functions, and in accordance with the designation of such board by the Governor, pursuant to section I of the act of December 22, 1944 (58 Stat. 887), as the official State agency to act in such matters.

SUMMARY OF COMMENTS, VIEWS, AND RECOMMENDATIONS

The comments, views, and recommendations of Colorado, submitted herewith, are summarized as follows:

(1) Colorado has long considered as desirable a project which would alleviate late-season water shortages on presently irrigated lands in

the Plateau Creek Valley in Colorado, and which would furnish urgently needed domestic and municipal water supplies in the Grand Valley area and for the city of Grand Junction, Colo.

(2) Colorado concurs in the findings of the project-planning report that the project therein described has engineering feasibility and will furnish a supplemental irrigation supply for 18,340 acres of lands now inadequately irrigated and a full irrigation supply for 2,310 acres of lands not presently irrigated; and also will provide approximately 14,400 acre-feet of water annually for domestic, municipal, and power supplies and the annual generation of 51,600,000 kilowatt-hours of firm power together with 6,670,000 kilowatt-hours of secondary power. The project plan includes the construction of a pipeline for conveying municipal and domestic water from the potential lower power plant near Cameo to an equalizing reservoir about 4 miles northeast of Grand Junction, such equalizing reservoir to be built by the water users. The ratio of benefits to cost is favorable, being estimated in the report as 2.34 to 1. It has also been estimated that municipal and domestic users would amortize their allocation of capital costs, amounting to $2,742,000, with 2-percent interest in a 60-year repayment period, and pay their share of operation, maintenance, and replacement costs. Irrigation users would be able to pay $20,000 annually for a 50-year period toward their allocation of capital costs in addition to operation, maintenance, and replacement. Power revenues are expected to pay power's full operation, maintenance, and replacement costs, and its full allocation of capital cost, with 3-percent interest, in 60 years.

(3) The allocation of capital costs, as between the various project features, including a nonreimbursable allocation to fish and wildlife preservation, is considered reasonable. Such allocation as stated in the report is as follows:

Allocation of capital costs

Municipal and domestic use	$2,742,000
Power production	6,313,000
Irrigation	3,987,000
Fish and wildlife preservation	257,000
Total	13,299,000

(4) It is recognized that the allocation to the various project purposes of annual operation, maintenance, and replacement costs has been made to correspond to the allocation of capital cost. Such annual costs are estimated in the report to amount to $108,800 annually and were allocated as follows:

Allocation of annual operation, maintenance, and replacement costs

Municipal and domestic use	$7,800
Power production	80,000
Irrigation	21,000
Total	108,800

Colorado recommends that an authorization of the project shall not preclude a readjustment of operation, maintenance, and replacement charges as between municipal and domestic users and power and irrigation users, which might more accurately reflect the actual use of water by such users.

(5) It is also recommended that an authorization of the project shall provide for the inclusion in the plan of a piped supply of domestic and stock water in the Plateau Valley in lieu of the contemplated bypassing of natural flows in the stream channels, in the event that further studies may indicate the feasibility of the inclusion of such a feature in the project plan due to the increased power production accruing from the utilization of the bypassed water in the power system.

(6) There is an area situated below the potential power and domestic pipeline, and lying between Mesa Creek and potential power plant No. 2, to which no water is at present available. It has been estimated that a small amount of water would make it possible to keep 1,000 additional cattle in the area. Colorado therefore recommends that consideration be given to the possibility of the release from the pipeline of the relatively minor amounts which would be required for such stock water.

(7) Colorado further recommends that the location of potential power plant No. 2, as described in the report, be not considered as limited by such description, and that further study is desirable to determine an elevation for this power plant which will be compatible with the most economical plan for all uses.

(8) In the acquisition of water rights for the purposes of the project, the view of the State of Colorado is that such water rights shall be considered as junior to all present vested rights to the use of water from the streams on which the project rights are to be acquired.

(9) Colorado strongly recommends, with regard to the project features for the purpose of fish and wildlife preservation, that the entire project area be open to free use of the public, with provisions for access adequate for the recreational needs of the general public, except for such portions as may be reserved for safety, or for the efficient operation of the project.

DETAILED COMMENTS

There has been long-recognized need for additional water for irrigation in the Plateau Valley. Natural stream flows in Plateau Creek and tributaries are low in the late summer months, so that supplemental water is a necessity for good growth of late summer and fall pasture, and for increased yields of forage crops, essential to the livestock industry predominating in the area. In all published and unpublished reports on the utilization of the Colorado River and its tributaries, this valley has been considered a critical area.

Coupled with this urgent need for irrigation water in Plateau Valley, there is a desperate need for additional domestic water in the Grand Valley, including both the rural and urban areas. The city of Grand Junction is handicapped by a water system incapable of supplying the present requirements and the needs of the immediate future. The population of Grand Junction was 12,479 in 1940. The present population is estimated at 18,500, and that of its metropolitan area at more than 35,000. These estimates are based on increases in the number of telephones and electric meters, building permits, postal receipts, retail sales, and average number of manufacturing employees.

The use of uranium for the development of atomic energy, and the production of synthetic liquid fuels from oil-bearing shales have both recently become of national importance and interest. The area

immediately southwest of Grand Junction contains one of the world's largest known deposits of uranium-bearing ore. At present there are about 1,500 presons, with an annual payroll of $700,000, employed directly or indirectly in the production and processing of uranium ores in the vicinity of Grand Junction, including 200 employees of the Atomic Energy Commission. There are plans for the immediate construction of a plant by Vitro Manufacturing Co., which will mean the addition of 50 families to the area.

To the north of Grand Junction there are rich deposits of oil shale, in quantity sufficient for a supply of liquid fuels for many years at the present rate of national consumption. Extensive experimental work by the Bureau of Mines, including a demonstration plant in operation at Rifle, Colo., for the extraction of liquid fuels from shale, has already accounted for a substantial increase in business in Grand Junction.

At the present rate of increase, the city's population should be about 27,000 by 1959, and that of the metropolitan area should be about 70,000.

An extensive field of natural gas immediately north of Grand Junction is being tested, and a dependable supply of gas would bring new industries to the area. It is practically certain that a large paper and pulp plant will be built east of Grand Junction in the near future. Private enterprise is considering the institution of large-scale production of liquid fuel from shale. All of these factors indicate that the rate of increase in population may be much greater in the immediate future than that which has been estimated under present conditions.

The situation with respect to domestic and stock water supplies is fully as critical in the rural and smaller urban areas of the Grand Valley as in the city of Grand Junction. An adequate sanitary domestic supply must be available to such areas in the immediate future. Domestic water for more than 1,000 farm homes must now be hauled from the supplies of the various municipalities and from artesian wells and stored in cisterns at these homes. It is estimated that the cost of hauling water to the rural users is over $2,000 per million gallons. Further, the draft on the artesian wells, and the low permeability of the aquifers have contributed to a serious lowering of the artisian head and of the yield of the wells. As a result, there is at present a potential controversy over rights to the artesian water. Local streams and ditches furnish fair supplies for stock water and some domestic use in the summer months, but in the winter these supplies are not available. The shallow ground water is of poor quality, and even the streams and ditches are becoming of worse quality yearly, with increased use for irrigation and industry.

The Collbran project would provide the most feasible means, as determined by extensive studies for the reported plan, as well as of various alternative plans, for the alleviation of the present shortages of late season water on the agricultural lands of the Plateau Valley and for furnishing water supplies of high quality to meet present and imminently potential demands of the farms, industries, and municipalities of the Grand Valley area.

The project would also furnish electric energy which would assist in meeting the increasing demands for power in the area. The plan

provides for replacement storage capacity for water which is diverted from the Plateau Valley streams for power, domestic, and municipal purposes, in order that an adequate irrigation supply may be available to the agricultural users in that valley.

The project has been endorsed by the Plateau Valley Water Association, representing those users, the city of Grand Junction, and the Clifton Fire Protection District representing domestic and municipal users outside of Grand Junction. All groups have expressed their extremely urgent needs for additional water supplies.

As stated in the summary of views and comments, Colorado considers the allocations of capital costs, as set forth in the report for the various project features, to be reasonable and equitable. The allocations of operation, maintenance and replacement costs, as stated in the report, have been made to correspond to the allocation of capital cost. This basis may not reflect accurately the proportionate actual use as between the irrigation users and the domestic, municipal, and power users. Further, as to the methods used in estimating the repayment capacity of the irrigated lands, which were the farm budget method and the income-to-land method, the types of farms selected for the analyses are probably representative of average conditions and practices in the project area. However, a considerable acreage in the area consists of pasture type lands presently being irrigated under junior priority rights. These lands may require a large portion of project water in order to firm up the present inadequate water supplies under those rights. Colorado therefore recommends that an authorization of the project shall be made which will not prevent a readjustment of operation, maintenance and replacement costs as between users, and that further studies are essential for the determination of the repayment ability of such pasture-type lands, and of allocations of such costs which will be considered equitable for all project purposes.

It is also recommended that the possibility of furnishing a piped domestic water supply to residents of the Plateau Valley shall not be considered as excluded from the project plan. Under the plan, supplies for municipal, domestic, and power purposes are proposed to be collected from Big Creek and Cottonwood Creek, which are tributaries of Plateau Creek. The present practice of water users on those streams is to utilize natural stream flow for domestic and stock purposes. The report indicates that sufficient flow for those purposes is proposed to be bypassed at the collection works during the winter months. This bypassed flow will not then be available for the generation of electric energy in the power system. An interest in a piped supply of domestic and stock water has been expressed by these water users, as it is apprehended that water flowing through the project canal in the summer months will not be of a quality suitable for domestic use, and icing conditions in the winter months will cause substantial loss of the bypassed flow to domestic, stock, and power users. Further studies are desirable to determine the feasibility of applying additional power revenues, due to the potential use of the bypassed water through the proposed power plant No. 1, toward the cost of construction of a stock and domestic water pipeline to dis-

tribute the water from the power plant to the users in the Plateau Valley.

Respectfully submitted.

LEE KNOUS,
Governor, State of Colorado.
CLIFFORD H. STONE,
Director, Colorado Water Conservation Board.
R. M. GILDERSLEEVE,
Chief Engineer, Colorado Water Conservation Board.
R. J. TIPTON,
Consulting Engineer, Colorado Water Conservation Board.

DEPARTMENT OF COMMERCE,
OFFICE OF DOMESTIC COMMERCE,
Washington, D. C., March 10, 1950.

Mr. MICHAEL W. STRAUS,
Commissioner, United States Department of Interior,
Bureau of Reclamation, Washington, D. C.

DEAR MR. STRAUS: Thank you for sending us your proposed report on the Collbran project, Colorado. We are glad to have this information, and understand that our field offices have no objections to the project.

The United States Coast and Geodetic Survey has the following comments to make with reference to coordinating their services with these project investigations. The comments are particularly applicable to future project investigations:

The various maps do not have meridians and parallels of latitude shown thereon. Elevations are shown on some, but no indication is given that they are expressed relative to mean sea level.

Triangulation surveys and precise leveling related to the Federal network of control surveys are essential for planning of large public works such as the Collbran project, so that coordination may be obtained for the various engineering surveys.

The United States Coast and Geodetic Survey provides these basic control surveys providing we have information as to where they are needed. Such information should be available to us so that the funds may be obtained and field surveys and office processing of survey notes completed sufficiently in advance so that the resulting data will be available in the preliminary as well as the construction phases of the project.

Sincerely yours,

H. B. MCCOY, *Director.*

STATE OF NEW MEXICO,
OFFICE OF STATE ENGINEER,
Santa Fe, January 24, 1950.

SECRETARY OF THE INTERIOR,
Washington, D. C.

SIR: On January 9, 1950, we received the Bureau of Reclamation report on the Collbran project in Colorado, which was prepared by region 4, Salt Lake City, Utah, in November 1949, and is designated as Project Planning Report No. 4–8a.5–2.

In compliance with the provisions of the Flood Control Act of 1944 (58 Stat. 887) the State of New Mexico submits the following comment:

The above-mentioned report indicates that the Collbran project will consume but a small portion of Colorado's allocation under the upper Colorado River compact, that the project is feasible from an engineering standpoint, and that it can be constructed under existing reclamation laws without help from the proposed Colorado River development fund. New Mexico favors the authorization and construction of the Collbran project.

Very truly yours,

JOHN H. BLISS, *State Engineer.*

THE STATE OF UTAH,
OFFICE OF STATE ENGINEER,
Salt Lake City, January 18, 1950.

MICHAEL W. STRAUS,
Commissioner, United States Department of the Interior,
Bureau of Reclamation, Washington, D. C.

MY DEAR COMMISSIONER STRAUS: Receipt of two copies of the Bureau of Reclamation report relative Collbran project, Colorado, together with your letter of transmittal, addressed to me under date of January 4, 1950, is acknowledged.

On behalf of the State of Utah, and pursuant to section 1 of the act of December 22, 1944 (58 Stat. 887) you are informed that Utah reports favorably relative its views and recommendations on the Collbran project, Colorado, identified as region 4 Project Planning Report No. 4–8a.5–2 and recommends its approval.

Respectfully,

HAROLD A. LINKE, *State Engineer.*

STATE OF WYOMING,
STATE ENGINEER'S OFFICE,
Cheyenne, January 17, 1950.

Mr. MICHAEL W. STRAUS,
Commissioner, Department of the Interior,
Bureau of Reclamation, Washington, D. C.

DEAR MR. STRAUS: This will acknowledge receipt of your letter of January 4, 1950, accompanied by two copies of the report of the Department of the Interior on the Collbran project in Colorado.

Agreeable to your request we have reviewed the above-captioned report, and offer the following comment thereon: It appears that the project has engineering feasibility with a benefit-cost ratio of 2.34 to 1, and since the proposed depletion is well within the allocation of Colorado under the terms of the upper Colorado River compact, we concur in the recommendations of the director of region No. 4 of the Bureau of Reclamation.

Yours very truly,

L. C. BISHOP,
State Engineer and Interstate Streams Commissioner.

P. S.—Copy No. 89 of the Collbran project report is being returned to you, together with the 20 copies of the Colorado River report. We have no need for more than one of the Collbran project reports in our files.

L. C. B.

EXECUTIVE OFFICE,
STATE HOUSE,
Phoenix, Ariz., January 12, 1950.

Mr. MICHAEL W. STRAUS,
Commissioner of Reclamation, Department of the Interior,
Washington, D. C.

DEAR MR. STRAUS: The Arizona Interstate Stream Commission has reviewed the project planning report on the Collbran project, Colorado, and has addressed to me a letter, the original of which is enclosed to you.

I approve of the action of the Arizona Interstate Stream Commission and have hereby adopted its letter as the official comments of Arizona.

Sincerely,

DAN E. GARVEY, *Governor.*

ARIZONA INTERSTATE STREAM COMMISSION,
Phoenix, Ariz., January 10, 1950.

Gov. DAN E. GARVEY,
State Capitol, Phoenix, Ariz.

DEAR GOVERNOR: We have reviewed project planning report No. 4–8a.5–2 of the Bureau of Reclamation, United States Department of the Interior, on the Collbran project, Colorado, together with the letter of transmittal from the Commissioner of Reclamation to the Secretary of the Interior and the letter of transmittal from the regional director of region IV of the Bureau of Reclamation to the Commissioner of Reclamation.

We assume, of course, that the proposed project has the approval of the State of Colorado and of the people of the project area.

Since the water to be utilized by the project is clearly within the share of Colorado under the Colorado River Compact and the Upper Colorado River Basin Compact, we find no objection to the project nor to the report.

Since it appears to us that the project is urgently needed by the people of the area, we recommend that the State of Arizona join in the recommendation of the Commissioner of Reclamation and of the Director of Region IV of the Bureau of Reclamation, contained in their letters of transmittal; and, therefore, join in the recommendation that the project be authorized for construction.

Yours very truly,

WAYNE M. AKIN,
Chairman.
RAY KEENAN,
Executive Secretary.

DEPARTMENT OF THE INTERIOR,
BUREAU OF RECLAMATION,
Washington, D. C., December 9, 1949.

The SECRETARY OF THE INTERIOR.

SIR: This is my proposed report on the potential Collbran project, in the upper Colorado River Basin in Colorado. My report is based

on and includes the accompanying report of the regional director, Salt Lake City, Utah, dated November 18, 1949.

The Collbran project is located in the Plateau and Grand Valleys at the base of Grand Mesa on the western slope of the Continental Divide in west central Colorado. It would supply needed irrigation, municipal, and domestic water, and electric energy.

Population pressure in the Plateau Valley has created an urgent need for additional water for irrigation, but because of the costs involved local interests cannot build the works needed to supply this water. In Grand Valley existing municipal and industrial demands are taxing the existing facilities to capacity. Domestic water for farm homes throughout the area must be hauled long distances or be taken from irrigation ditches. The latter source produces water of doubtful potability. The normal growth of Grand Valley will soon increase the demand for water beyond the physical capacity of existing works. Power supplies in the area are already inadequate and it is anticipated that industrial development of oil-bearing shales, uranium ores, and coal will aggravate the shortage.

The plan of development for the Collbran project provides for diversion of a minimum of 20 second-feet continuous flow from two Grand Mesa streams, Big and Cottonwood Creeks, by a pipeline, which would transport the water for industrial and municipal use, to an equalizing reservoir near Grand Junction. The diverted water would be used en route at two power plants to generate annually 51,600,000 kilowatt-hours of firm power and 6,670,000 kilowatt-hours of secondary power. Stream-flow regulation needed to accomplish this diversion would be provided by enlarging Benham Reservoir on Big Creek and utilizing eight small natural lakes in the upper reaches of Big and Cottonwood Creeks. As the water that would be diverted to Grand Valley is now used for irrigation in Plateau Valley, it would be replaced by surplus spring runoff from upper Plateau, Leon, and Park Creeks that would be stored until needed in the potential Vega Reservoir. With regulation at Vega Reservoir these streams would provide, in addition to the required replacement, an average of about 15,900 acre-feet of water annually as a new irrigation supply for 20,650 acres of land in Plateau Valley including 2,310 acres now idle for lack of water and 18,340 acres inadequately irrigated.

The project plan includes provisions recommended by the Fish and Wildlife Service to increase fish and wildlife values. Recreational facilities recommended by the National Park Service would be provided, to the maximum practicable extent after project construction. Costs of recreational development are not included as a part of the indicated construction cost. Silt and flood-control benefits from this project are minor. The project does not involve stream-pollution abatement, Indian lands, or navigation.

Rights to the use of the water required for the project could be obtained in accordance with the Colorado State water law. The project would consume less than 1 percent of the Colorado River water which it is estimated, will be available for future development in the State of Colorado under the terms of the upper Colorado River Basin compact.

The estimated construction cost of the Collbran project is $13,299,000. Operation, maintenance, and replacement cost of the

project works are expected to average $108,800 annually. Based on the annual benefits of the project accruing through the preservation and propagation of fish and wildlife over the repayment period, a nonreimbursable allocation of $257,000 is proposed in the report. The remaining $13,042,000 would be reimbursable and would be allocated as follows: Irrigation, $3,987,000; power production, $6,313,000; and municipal use $2,742,000.

The reimbursable construction costs would be returned in full to the United States. Irrigation water users would be required to repay $20,000 annually toward construction costs, in addition to paying their share of operation, maintenance, and replacement costs. Over the recommended 50-year repayment period, following a 3-year development period, this would return $1,000,000. The balance of the irrigation allocation would be assigned for repayment from the interest component of the power revenues. Municipal and industrial water users would be required to repay their share of the construction costs of the project in 60 years, with interest at 2 percent, a total of $78,880 annually, in addition to paying their share of the operation, maintenance, and replacement costs. This would return the municipal water allocation of $2,742,000 plus interest amounting to $1,991,000.

Power rates of 5.6 mills per kilowatt-hour for firm energy and 3 mills for nonfirm energy would return $308,960 annually, which would pay the operation, maintenance, and replacement costs, and return the capital costs allocated to power in 60 years, with 3 percent interest, and provide a balance at the end of this period of $139,000. The interest payments, amounting to $7,285,600, would be used in part to repay that portion of the irrigation allocation which is beyond the ability of the water users to repay.

It will probably be desirable at a future date to consolidate the Collbran project in a basin plan for development of the upper Colorado River Basin.

I concur in and adopt the recommendations of the regional director as set forth in paragraph 26 of his report.

I recommend that you approve and adopt this report as your proposed report on the Collbran project and that you authorize me, in your behalf, to transmit copies to the States of the Colorado River Basin and to the Secretary of the Army in accordance with the requirements of the Flood Control Act of 1944 (58 Stat. 887), to the State of Colorado for the views and recommendations of the head of the agency exercising administration over the wildlife resources of the State of Colorado in accordance with provisions of the act of August 14, 1946 (60 Stat. 1080), and to other interested Federal agencies for their comments.

Respectfully,

/s/ MICHAEL W. STRAUS, *Commissioner.*

Approved and adopted, December 30, 1949.

OSCAR L. CHAPMAN,
Secretary of the Interior.

DEPARTMENT OF THE INTERIOR,
BUREAU OF RECLAMATION, REGION 4,
Salt Lake City, Utah, November 18, 1949.

To: Commissioner.
From: Regional Director.
Subject: Report on Collbran project, Colorado.

1. This letter is submitted as my report on the potential Collbran project in west-central Colorado, planned as part of the Colorado River Basin development to supply needed irrigation, municipal, and domestic water and electric energy. Substantiating materials on which the report is based, including detailed reports of the Bureau of Reclamation, Fish and Wildlife Service, and National Park Service, are appended.

2. Authority to make this report and supporting investigations is provided in the Federal reclamation laws, act of June 17, 1902 (32 Stat. 388) and acts amendatory thereof or supplementary thereto, particularly the Boulder Canyon Project Act (45 Stat. 1057) and the Boulder Canyon Project Adjustment Act (54 Stat. 744).

NEED FOR DEVELOPMENT

3. Plateau Valley at the base of Grand Mesa on the western slope of the Continental Divide is in urgent need of additional water for irrigation. As the population pressure has increased the average farm unit has decreased in area and now some units are too small for economic operation. Land characteristics of the valley and its cool climate are ideally suited for the production of livestock feed, but the lack of late summer water results in low farm yields and immature crops and leaves the pastures practically useless after midsummer. Works to supply the needed irrigation water cannot be constructed by local interests because of the costs involved.

4. Grand Valley, lying along the Colorado River west of Plateau Valley, urgently needs additional water for industrial and municipal development and rural domestic use. The municipal water system of Grand Junction, principal city of the valley, is taxed to capacity and has no reserve to meet increasing demands. Domestic water for farm homes throughout the valley must be hauled long distances and stored in cisterns or taken as needed from irrigation ditches. It is becoming progressively more difficult to obtain even this unsatisfactory supply as the rural population is increasing and the stream flow of the area is becoming more and more polluted from intensified use. Present industrial demands for water in Grand Valley are met with difficulty. Increased demands for municipal and industrial water are anticipated for normal growth and for probable accelerated growth resulting from the development of nearby mineral deposits, including oil-bearing shales, uranium ores, and coal. These and other anticipated developments will require additional power supplies.

PLAN OF DEVELOPMENT

5. The Collbran project would provide the water needed in Grand and Plateau Valleys through water exchanges and through storage regulation of the stream runoff tributary to Plateau Creek on the northern slope of Grand Mesa. It also would provide electric energy

for use in west-central Colorado. The project plan includes provisions recommended by the Fish and Wildlife Service to increase fish and wildlife values. Recreational facilities recommended by the National Park Service would be provided after project construction so far as such facilities could be constructed consonant with the use of project water for domestic purposes. The facilities recommended are not included as part of the project plan and their costs are not included in the estimated project costs as recreational development would be dependent on limitations imposed in the interests of public health by domestic water users and various agencies. The estimated costs of recreational development and the benefits that would result if the facilities were constructed have been considered, however, in the comparison of project benefits and costs. The project would only slightly affect silt and flood control. It would not involve stream-pollution abatement, Indian lands, or navigation.

6. Runoff of two of the Grand Mesa streams, Big and Cottonwood Creeks, would be diverted by pipeline as a supplemental municipal and domestic water supply for Grand Valley. This water would be utilized in its steep drop to the valley from its origin on the mesa slopes to produce approximately 51,600,000 kilowatt-hours of firm power and 6,670,000 kilowatt-hours of nonfirm power annually. A minimum flow in the pipeline of 20 second-feet would be maintained throughout the year by storage regulation in the Bonham Reservoir on Big Creek and eight small natural lakes on the upper reaches of Big and Cottonwood Creeks. As the water that would be diverted to Grand Valley is presently used for irrigation in Plateau Valley, it would be replaced with surplus spring runoff from upper Plateau, Leon, and Park Creeks that would be stored until needed at the potential Vega Reservoir. With regulation at Vega Reservoir these streams also would provide an average of about 15,900 acre-feet of water annually as a new irrigation supply for 20,650 acres of land in Plateau Valley, including 2,310 acres now idle for lack of water and 18,340 acres inadequately irrigated. All the lands served by these streams would be assured adequate late-season water with only moderate shortages in years of extreme drought.

7. Bonham Reservoir on Big Creek, chief storage feature for municipal and power supplies, would be enlarged to a capacity of 6,300 acre-feet, almost six times its present capacity. The eight natural lakes, having a total capacity of 3,830 acre-feet, would continue to be utilized without further development under the project. The water supply for the power and municipal system would be collected from the Big and Cottonwood Creek watersheds by two canals that would be constructed as project features—the East Fork feeder canal of 30 second-feet capacity and 1.1 miles in length and the Cottonwood feeder canal of 15-second-foot capacity and 2.1 miles in length. The pipeline that would be constructed to convey the water from the reservoirs to the valley would be approximately 44 miles in length. It would receive water from Bonham Reservoir and from Big Meadows Reservoir, one of the small natural lake basins on Cottonwood Creek. Two interconnected power plants would be constructed along the pipeline course—the upper one near Molina of 5,000-kilowatt capacity and the lower one near Cameo of 2,400-kilowatt capacity. Power supplies would be delivered near the Cameo power plant for distribution. Municipal water would be delivered to an equalizing reservoir

that would be constructed by the water users about 4 miles northeast of Grand Junction.

8. Vega Reservoir on Plateau Creek, chief project feature for irrigation development, would be built to a total capacity of 30,000 acre-feet. It would be created by construction of Vega Dam, a rolled earth- and rock-fill structure, 140 feet in height and 1,765 feet in length at the crest. A feeder canal of 200-second-foot capacity and a little more than 2 miles in length would be constructed to convey flows of Leon and Park Creeks to the reservoir. The Southside canal, 30 miles in length and with a diversion capacity of 225 second-feet, would be constructed to convey the water from the reservoir to the project lands.

9. The Collbran project would consume only about one-half of 1 percent of the upper Colorado River Basin water allocated to the State of Colorado for future development under the terms of the upper Colorado River Basin compact. Rights to the use of the water required for the project could be obtained in accordance with the Colorado State water law.

COSTS AND COST ALLOCATIONS

10. Estimated capital costs of the project features that would be undertaken by the Federal Government are listed in the tabulation on the following page. The estimates include costs of necessary lands or interests in lands and miscellaneous cost items. Costs are estimated at July 1948 prices which are essentially the same as prices of October 1949.

Estimated capital costs

Vega Dam and road relocation	$2,605,000
Leon-Park feeder canal	337,000
Bonham Dam and appurtenant works	1,787,000
East Fork feeder canal	27,000
Cottonwood feeder canal	63,000
Southside canal	1,864,000
Pipeline and penstock	3,537,000
Power plants and appurtenant works	1,511,000
Service roads for power and domestic features	23,000
Fish screens	3,000
Investigations and surveys (reimbursable funds)	28,000
Operating equipment and operation and maintenance during construction	45,000
Undistributed engineering and overhead	353,000
Subtotal	12,183,000
Valley pipeline below power plant No. 2 [1]	1,116,000
Total	13,299,000

[1] Costs based on estimates prepared by R. J. Tipton and Associates, engineering firm of Denver, acting in the interests of the city of Grand Junction.

11. Capital costs of project features have been allocated to the various project purposes by averaging the results of the priority-of-use and alternative-justifiable-expenditure methods. Every purpose of the development would be charged no more than the value of the benefits it would receive and less than the cost of the same benefits under the cheapest alternative development. The allocations made are as follows:

Allocation of capital costs

Municipal and domestic use	$2,742,000
Power production	6,313,000
Irrigation	3,987,000
Fish and wildlife preservation	257,000
Total	13,299,000

12. Operation, maintenance, and replacement costs of the project works are expected to average $108,800 annually over a 60-year period. Of this amount an estimated $78,500 would be required for general operation and maintenance of project works. The remaining $30,300 would be required for replacements. The portion of these costs required for power facilities was based on July 1948 prices. The remaining costs were estimated from average 1939–44 prices.

13. Operation, maintenance, and replacement costs have been allocated to the various project purposes by the priority-of-use method. These allocations are given in the following tabulation.

Allocation of annual operation, maintenance, and replacement costs

Municipal and domestic use	$7,800
Power production	80,000
Irrigation	21,000
Total	108,800

REPAYMENT

14. Capital costs allocated to irrigation, power, and municipal water would be reimbursable. These costs could be repaid from power and municipal water revenues over a 60-year period and from irrigation payments over a 50-year period. These reimbursement periods are considered to be appropriate for the Collbran project. Reimbursement periods of the same duration will be proposed for projects in the upper Colorado River Basin that would be aided by revenues of the Colorado River storage project. Subject to approval by the Secretary of the Interior, capital costs allocated to fish and wildlife preservation would be nonreimbursable. If, however, reimbursement of these costs is required, allocations to irrigation, power, and municipal water would be increased slightly but not enough to lengthen the payment periods. Payment of project costs could best be made through a water conservancy district since such a district could levy assessments on both the project lands and the municipalities and industries served.

15. Municipal and domestic users would be required to pay $86,680 annually for 60 years to amortize their allocation of capital costs with 2 percent interest and to pay their share of operation, maintenance, and replacement costs. The interest component, amounting to $1,991,000 in 60 years, would be paid to the United States Treasury.

16. Rates of 5.6 mills a kilowatt-hour for firm energy and of 3 mills a kilowatt-hour for nonfirm energy would be established for the sale of power. Revenues accruing at these rates, which would total $308,960 annually, would pay power's full operation, maintenance, and replacement costs and in 60 years would pay its full allocation of capital costs with 3 percent interest and provide a balance of $139,000.

The interest component amounting to $7,285,600 in 60 years would be used in part to assist in payment of the irrigation allocation. Should firm power be sold for 6 mills a kilowatt-hour for the first 6 years of project operation and 5.5 mills thereafter, payment of the power allocation could also be made in 60 years. If all firm power were sold at 5.5 mills, however, 64 years would be required for payment.

17. A 3-year development period would be desirable after the first delivery of project water for irrigation, during which the irrigators would be assessed only the costs of operation, maintenance, and replacements and would pay nothing on capital costs. In his period they could fully prepare and improve their lands for project operation. After the development period the irrigators would pay $20,000 annually toward capital costs. In 50 years this would retire $1,000,000 of the irrigation allocation. Payment of the remaining $2,987,000 would require 41 percent of the interest component on the power allocation. If the payment period for irrigation were limited to 40 years, assistance in the amount of $3,187,000 or 44 percent of the interest component on power would be required.

18. It will probably be desirable at a future date to consolidate the Collbran project power system with other potential Federal power developments of the Colorado River storage project. An interconnection between the Collbran power plants and these other plants in the upper Colorado River Basin would permit maximum flexibility of operation and maximum utilization of available water. Such a combination would also permit the pooling of financial operations resulting in a uniform power rate throughout the basin.

ANNUAL BENEFITS

19. Measurable benefits of the project are expected to average $1,128,500 annually, of which $716,160 would be direct benefits and the remaining $412,340 would be derived indirectly from the project as a result of its stimulation on business and industry. Numerous other benefits of an intangible nature would result from the project.

20. The estimated direct benefit of $716,160 annually would be comprised of the following items:

Irrigation—increased crop and livestock production	$178,800
Power production—gross revenues from sale of power	308,960
Domestic and municipal water—estimated cost of cheapest alternative equivalent supply	203,500
Fish and wildlife preservation	9,300
Recreation—should facilities recommended by National Park Service be constructed	15,600
Total	716,160

21. The expected indirect annual benefit of $412,340 would be derived from the following items:

Irrigation—off-the-farm transportation and processing of increased agricultural products, and increased local sales of goods and services	$160,600
Power production—savings in power-production costs and increased value of goods and services produced by utilization of power	251,740
Total	412,340

COMPARISON OF BENEFITS AND COSTS

22. The benefits of the development would compare with the attendant Federal costs in a ratio of 2.34 to 1, indicating that an increase in economic value of approximately $2.34 would result from each Federal dollar expended. This relationship indicates the degree of the project's economic justification. The ratio was determined by comparison of the annual benefits, estimated at $1,128,500 on the basis of average prices for the period 1939–44, and the annual equivalent costs, estimated at $482,800 with construction costs based on the much higher prices of July 1948. Actually the benefit-cost ratio may change, depending on the relationship between prices at the time of construction and average prices prevailing through the useful life of the project.

23. For a determination of the annual equivalent cost the project life was assumed to be 100 years. The costs thus computed include $364,700 for amortization of total capital costs at 2.5 percent interest with allowances for salvage values and for interest costs during construction. The annual costs also include $118,100 for operation, maintenance, and replacement costs with the allowance for replacements serving as a sinking fund at 2.5 percent interest. Capital costs of $179,300 that would be required for construction of recreational facilities were included in the analysis, and allowance was made for operation, maintenance, and replacements of such facilities. Indirect private capital costs that would be incurred with the development, such as increased annual investments in labor and equipment, were not included in the analysis as these would be more than offset by the project's intangible benefits.

COOPERATION AND ACKNOWLEDGMENTS

24. The Fish and Wildlife Service and the National Park Service participated in the investigations with the Bureau of Reclamation as a part of the general interagency cooperation in the river-basin studies program, and their reports are included in the substantiating materials to this report. The proposed report was transmitted for review by by the regional offices of the Department of Army, Federal Power Commission, Department of Agriculture, and Department of Commerce in accordance with the policies and procedures established by the Federal Interagency River Basin Committee for distribution and coordination of reports at regional level. The report has also been reviewed by the Fish and Wildlife Service, Bureau of Indian Affairs, National Park Service, Geological Survey, and the Bureau of Mines in the Department of the Interior, and by the Colorado Water Conservation Board of the State of Colorado. The comments received have been considered in preparing the final draft of the report. In addition, a number of these Federal agencies, as well as numerous State and local agencies assisted in the course of the investigations with helpful information and data.

CONCLUSIONS

25. The Collbran project as outlined in this report has engineering feasibility, and its total cost could be retired by the irrigators paying for 50 years and municipal water users and power users paying for 60 years The project benefits would compare with the costs in a ratio of 2.34 to 1. Local and State officials desire the project as planned. Water rights adequate for the project could be acquired.

RECOMMENDATIONS

26. It is recommended:

(1) That the plan of development as described in this report be approved.

(2) That the project features listed in paragraph 10 hereof and such related works as may be incidental thereto, constituting the Collbran project in the Colorado River Basin in Colorado, be authorized to be constructed, operated, and maintained by the Bureau of Reclamation in accordance with Federal reclamation law, act of June 17, 1902 (32 Stat. 388) and acts amendatory thereof or supplementary thereto, except as to repayment period, and substantially in accordance with the plans set forth in the report, with such modifications, omissions, or additions to the works as the Commissioner of Reclamation, with approval of the Secretary of the Interior, may find proper and necessary to meet unforeseen physical or economic conditions.

(3) That consideration be given in the future to the inclusion of this project in any basin plan which may be developed in the upper Colorado River Basin.

E. O. LARSON.

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